

Patent Claims

1. Method of producing a bar-shaped hard metal tool comprising at least two materials of different hardness, wherein the first material has the lower hardness and forms a bar-shaped support for the second, harder material, characterised in that

- the first material is provided within a first extrusion tool (P1) in the form of a plastic mass flow,
- the second material is provided within a second extrusion tool (P2) similarly in the form of a plastic mass flow,
- the second material is fed to the first extrusion tool (P1) and forced within the first extrusion tool (P1) into the first mass flow,
- a common plastic mass flow of the first and second material is issued from the first extrusion tool as a bar-shaped body in which the first material forms a bar-shaped support for the second material and
- the bar-shaped body issued from the first extrusion tool is further processed to form a hard metal tool.

2. Method according to claim 1, characterised in that the second material is forced into the first mass flow with use of a nozzle.

3. Method according to claim 2, characterised in that the second material is forced into the first mass flow with use of a nozzle with a non-round cross-sectional shape.

4. Method according to claim 3, characterised in that the second material is

forced into the first mass flow with use of a nozzle with elongate cross-sectional shape.

5. Method according to any one of the preceding claims, characterised in that the second material is provided by means of a second extrusion tool (P2) and is fed to the first extrusion tool (P1) by way of a channel connecting the two extrusion tools.

6. Method according to claim 5, characterised in that the required volume flows of the materials are set in dependence on output signals of a sensor.

7. Method according to claim 6, characterised in that measurement of the exit speed of the cylindrical body from the first extrusion tool (P1) is carried out by means of the sensor.

8. Method according to claim 7, characterised in that the speed of the mass flow of each of the first and second extrusion tools (P1, P2) is undertaken by respective control of the movement of a piston in dependence on the output signals of the sensor.

9. Method according to any one of claims 5 to 8, characterised in that the material provided by means of the second extrusion tool (P2) is conducted to the first extrusion tool (P1) by way of a controlled valve.

10. Method according to claim 9, characterised in that the valve is controlled in dependence on the output signals of a sensor.

11. Method according to any one of claims 8 to 10, characterised in that control of the movement of the piston and/or the valve is undertaken in such a manner that forcing of the second material into the first mass flow takes place only within predetermined time intervals in such a manner that the second material is forced merely into the front region of the body leaving the first extrusion tool (P1).

12. Method according to any one of the preceding claims, characterised in that further materials each present in the form of a plastic mass flow are forced into the first mass flow within the first extrusion tool (P1).

13. Device for carrying out the method according to any one of claims 1 to 12, comprising

- a first extrusion tool (P1) within which the first material can be pressed in the form of a plastic mass flow in direction towards the nozzle mouthpiece (2) thereof,
- a second extrusion tool (P2) by means of which the second material is provided in the form of a plastic mass flow,
- a channel (4) connecting the two extrusion tools and
- a further nozzle (10) by which the second material can be forced into the first material.

14. Device according to claim 13, characterised in that the further nozzle (10) has a non-round cross-sectional shape.

15. Device according to claim 14, characterised in that the further nozzle has an elongate cross-sectional shape.

16. Device according to any one of claims 13 to 15, characterised in that it comprises a control unit (21) provided for setting the required volume flows of the materials.

17. Device according to claim 16, characterised in that it comprises a sensor (22) connected with the control unit (21) and that the control unit (21) is provided for setting the required volume flows in dependence on output signals (ss) of the sensor.

18. Device according to any one of claims 13 to 17, characterised in that it

comprises a valve (23) arranged in the channel (4) connecting the two extrusion tools.

19. Device according to any one of claims 16 to 18, characterised in that the control unit (21) is provided for controlling the valve (23).

20. Device according to any one of claims 13 to 19, characterised in that it comprises at least one further extrusion tool (P3), which is connected with the first extrusion tool (P1) by way of a channel (20), wherein the at least one further extrusion tool (P3) is provided for preparing a further material present in the form of a plastic mass flow.

21. A bar-shaped hard metal tool comprising at least two materials of different hardness and produced according to a method according to any one of claims 1 to 12, in which the first material has a lower hardness and forms a bar-shaped support for the second, harder material.

22. Hard metal tool according to claim 21, characterised in that the second, harder material forms the cutting region of the tool.